

LOCFIELD® RFID

A New UHF RFID Antenna Technology





Outline

What is special about the antenna?

Challenging RFID solutions now made easy

Reference Implementations



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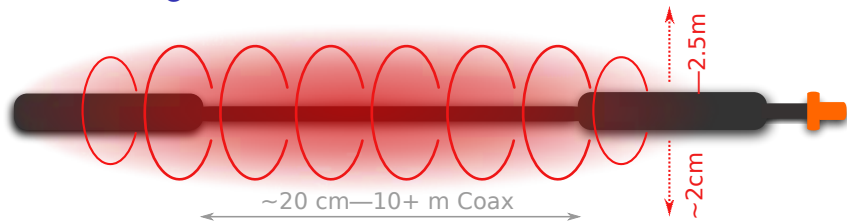
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How does it work?

LOCFIELD[®] — The antenna generates a **localized electromagnetic field**.



Key Concept – Coupled Mode Operation

An electromagnetic field follows the antenna. Only a negligible fraction of the field is radiated.



Characteristics of the antenna field

An electromagnetic field coupled to the antenna has significant advantages:

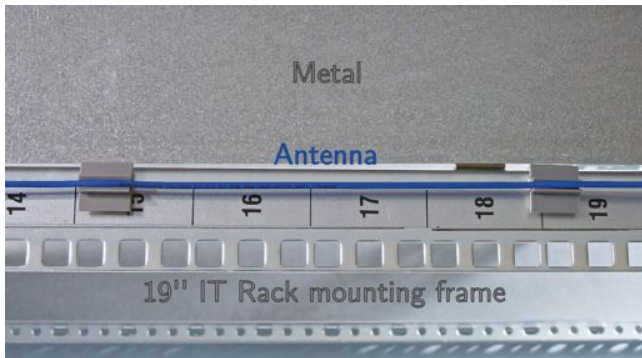
- A clearly defined RFID read zone around the antenna.
- Precisely adjustable read range by variation of signal power.
- Seamless coverage of read ranges from 1 cm to ≈ 1.5 m around the antenna.
- Effective suppression of unwanted tag reads due to almost reflection-free operation.
- Effective shielding \rightarrow no reads »around corner«.
- Complex paths, 2- and 3-dimensional structures are feasible.

This leads to a wide range of new RFID applications which can hardly be realized with conventional technology.



Ease of implementation

Installation of the LOCFIELD® antenna is like mounting a cable ...



... even close to or on metal.



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Design goals

Great results are possible even using a simple coaxial cable based antenna design

- Quick and easy to mount
- Installable in almost any environment
- Simple tuning and optimization
- Rapid and cheap deployment
- Robust and cheap to maintain and operate
- Requires the lowest number of reader ports
- Can run uninterruptedly, no need for additional sensors, switches, etc.

Read everything, everywhere, permanently!



Where can the antenna be used?

Long antennas ($\rightarrow 5$ m) can follow complex, elongated geometries

along mounting bars, rails and frames, (book-)shelves, support structures, assembly lines, door frames,

Long antennas can fill various areas in two or three dimensions

workbenches, desks, shelves, floor areas

Short antennas (≈ 0.5 -2 m) cover mid-range UHF reading ranges

door- or wall-mount RFID portals, EAS passages, RFID tracking points



Implementation breakthroughs

Several meters of smart shelves, e.g. libraries, retail stores, racks, can be covered with only one reader port.

Read ranges can be adjusted within a few centimeters of tolerance without unwanted reflections.

Large metal cabinets (e.g. IT racks, electrical, medicine, tools) can be inventoried using only one reader port in most cases.

Mid-range RFID tracking points can be installed almost anywhere at very low costs.



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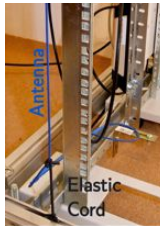
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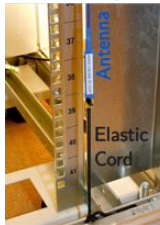


Metal cabinets

- UHF Read range \approx 5-20 cm around antenna
- Almost entire rack-front covered
- Items in front of rack are not read
- Flexible quick-mount ensures free way for service tasks
- Objects passing by are tracked with outside antenna
- Outside antenna \approx 1-1.5 m read range
- Only two reader ports required for inventory and track



Bottom left



Bottom right





Smart Shelves

Smart Shelves can be freely configured

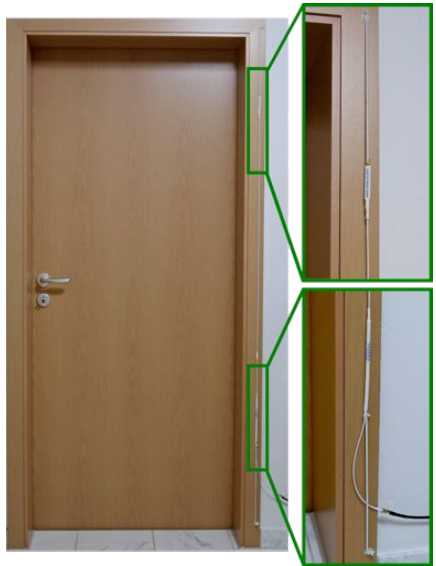


- Read range \approx 2-50 cm above and below shelf
- Field-free zones are possible
- One antenna can run along several meters of shelf \rightarrow very few antenna ports are required



Door- or EAS-Portal

- One antenna can cover entire door passage
- Installation within a few minutes
- Antenna can run permanently → no additional sensors necessary
- Small footprint, almost invisible, fits perfect in offices, stores, libraries, etc.
- Second antenna at the outer side can be used for direction detection





Innovation in RFID

info@cavea-id.com